

ABSTRACT OF THE DISCLOSURE

Separation devices and systems are described which have a stationary phase and a mobile phase, wherein the stationary phase contains carbon-clad zirconium dioxide particles
5 having attached at least one organic group. The stationary phase which is used in the present invention has the ability to dial in the selectivity by attaching the proper organic groups onto the carbon-clad zirconium dioxide particles in order to achieve the desired separation. Various separation processes are described such as chromatography, electrophoresis, magnetic separations, membrane separations, and the like. The processes to accomplish these
10 types of separations are also described.